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## BHCTP Monthly Discharge Monitoring Report

Month: December-17

Facility: Central Treatment Plant

Location: Bunker Hill Superfund Site

Contract Number: W912DW-16-C-0012 Amec Foster Wheeler/Wood

Total Flow For The Month From 006 Outfall: 67,280,860 gallons

Sludge pumping to CIA sludge pond: 1,278,000 gallons

Total Flow From Kellogg Tunnel: 67,280,860 gallons

Percent of Influent Successfully Treated: 100.0%

13 sample days \* 6 parameters (Pb, Cd, Zn, Mn, TSS & pH) = 78 potential exceedances  
**78 - 0 exceedances = 78 78/78 = 100%**

### Results of Sampling Efforts:

All sampling has been performed in accordance with specifications and the Sampling and Analysis Plan.

Performance Evaluation (PE) sampling was not performed for this reporting period.

Trip blank and rinsate sampling was performed, with the results being reported on the 'PTM-004,RB,TB' page of this DMR.

### Highlights of Plant Maintenance and/or Plant Optimization:

**12-01-17** Performed monthly fire extinguisher inspection. All CTP fire extinguishers are fully charged and in good working condition at this time.

**12-01-17** Performed monthly pump and motor inspection. All CTP pumps and motors are in good condition at this time.

**12-01-17** Decreased the CTP operating pH set point from 8.40 to 8.30. Treated outfall zinc level average has decreased below 0.250 m. The process engineer and LWTPO have discussed the pH set point decreased and agreed that the decrease will aid in lime savings. The decrease in the operating pH set point will not cause discharge exceedance.

**12-05-17** 05:30 - 13:30 Operators performed a lined storage pond pumping event to decrease the water volume. The lined storage pond level is being decreased to support the effluent tie-in project.

**12-05-17** LWTPO and SSHO attended the AMEC/Wood BHCTP construction sequencing review meeting as requested. LWTPO attended the site inspection and construction sequencing evaluation walk through and provided site information as requested.

**12-05-17** Operators discovered that the treated outfall flow meter display is not functioning. The treated outfall will be estimated until further notice. The outfall flow meter continues to send gallons per minute discharge to the PLC and work stations. This flow reading along with the KT discharge flow and 600 gpm sludge pumping rate will be used to estimate the total daily discharge flow.

**12-05-17 - 12-12-17** Operators performed a lined storage pond pumping event to decrease the water volume. The lined storage pond level is being decreased to support the effluent tie-in project.

**12-12-17** Operators performed the monthly no load emergency generator run test. The emergency generator operated for one half hour as programmed with no issues or errors to report.

**12-16-17** Operators initiated the lined storage pond pumping schedule to reduce the amount of water accumulated. The lined storage pond level is currently 2274.3 (4.7 MG).

**12-18-17 Through 12-20-17** Performed lined storage pond pumping with 2 pumps as indicated in the attached December daily log report.

**12-26-17** Operators performed the monthly full load emergency generator run test. The emergency generator operated all CTP components for one hour as programmed with no issues or errors to report.

**12-29-17** The CTP experienced several short term power outages causing treatment plant shutdowns. Operators performed several pump and motor inspections and restarts through the night. The emergency generator was activated for approximately 1 hour during the longest of the power outages. 02:30 12-30-17 the CTP was in full operation with no issues.

**12-31-17** Performed monthly reset of the KT and treated outfall flow meters. Documented monthly and annual totals on the KT & 006 flow page of this report.

- The Kellogg Tunnel discharge flow increased by 22% from December 2016, from 52.0 mg to 67.2 mg.
- The Kellogg Tunnel zinc concentration increased by 20% from December 2016, from an average of 50 mg/L to 60 mg/L.
- The CTP operating pH set point was increased from 8.3 to 8.5 during lined storage pond pumping and KT low flow events.
- The flocculent dosage was increased to 2.5 PPM from 1.5 PPM during lined storage pond pumping events.
- The CTP sludge recycle rate remained at 400 gpm.
- CTP operators received no off-shift auto dialer call-out alarms.
- CTP operators performed thirteen pumping events from the Lined Pond.
- CTP operators verified Aeration Basin pH probe and grab sample values twice per day.
- CTP operators provided several hours of overtime support to AFW/Wood projects during this reporting period.

No significant lessons to report for last month.

#### Lessons Learned

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MONITORING PERIOD						
YEAR	MO	DAY		YEAR	MO	DAY
2017	12	1		2017	12	31

PARAMETER		Quantity or Loading			Quality or Concentration				FREQUENCY OF ANALYSIS	SAMPLE TYPE
		MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	MINIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS		
pH	Sample Measurement				6.80		7.00		Continuous	Meter
	Permit Required				6.00		10.0			
Flow Thru Treatment Plant	Sample Measurement	2.21	3.30	mgd						
	Permit Required		Daily							
Lead Total - Pb Effluent	Sample Measurement	0.05	0.07	lbs/day		0.003	0.003	mg/L	three samples/ week	Comp 24
	Permit Required	14.8	37.0			0.30	0.60	mg/L		
Zinc Total - Zn Effluent	Sample Measurement	4.68	6.94	lbs/day		0.26	0.32	mg/L	three samples/ week	Comp 24
	Permit Required	36.2	91.3			0.73	1.48	mg/L		
Cadmium - Cd Effluent	Sample Measurement	0.17	1.377	lbs/day		0.008	0.050	mg/L	three samples/ week	Comp 24
	Permit Required	2.40	6.10			0.050	0.100	mg/L		
Manganese - Mn Effluent	Sample Measurement	798	1336	lbs/day		44.2	56.2	mg/L	three samples/ week	Comp 24
	No Permit Required					N/A	N/A	mg/L		
Total Suspended Solids - TSS	Sample Measurement	19.7	39	lbs/day		1.0	1.6	mg/L	three samples/ week	Comp 24
	Permit Required	985	1907			20	30	mg/L		

PREPARED BY: GARY FULTON

REVIEWED BY: BRIAN JOHNSON

**NPDES DISCHARGE POINT 006  
CENTRAL TREATMENT PLANT  
MONTH: Dec-17**

DAY	LEAD (Pb)		ZINC (Zn)		CADMIUM (Cd)		MANGANESE (Mn)		pH	FLOW	TSS		LOADING
	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day			mg/L	lbs/day	kg/day
1	0.0026	0.056	0.183	3.92	0.0039	0.08	36.5	783	6.8	2.57	1.0	21.4	9.73
2		0.055		3.88		0.08		774		2.54		21.2	9.61
3		0.055		3.85		0.08		768		2.52		21.0	9.54
4	0.0026	0.054	0.226	4.67	0.0039	0.08	38.0	785	6.9	2.48	1.2	24.8	11.2
5		0.053		4.62		0.08		777		2.45		24.5	11.1
6	0.0026	0.055	0.239	5.09	0.0041	0.09	39.5	842	7.0	2.55	1.0	21.3	9.66
7		0.056		5.19		0.09		857		2.60		21.7	9.84
8	0.0030	0.064	0.241	5.15	0.0080	0.17	40.5	865	7.0	2.56	1.4	29.9	13.6
9		0.065		5.25		0.17		882		2.61		30.5	13.8
10		0.064		5.17		0.17		868		2.57		30.0	13.6
11	0.0026	0.055	0.304	6.45	0.0062	0.13	50.5	1072	7.0	2.54	1.2	25.5	11.6
12		0.056		6.55		0.13		1088		2.58		25.8	11.7
13	0.0026	0.056	0.317	6.78	0.0058	0.12	49.6	1060	7.0	2.56	1.0	21.4	9.7
14		0.045		5.48		0.10		857		2.07		17.3	7.8
15	0.0026	0.019	0.244	1.79	0.0046	0.03	45.6	335	6.8	0.88	1.6	11.7	5.33
16		0.048		4.48		0.08		837		2.20		29.4	13.3
17		0.055		5.17		0.10		966		2.54		33.9	15.4
18	0.0026	0.056	0.252	5.47	0.0500	1.08	48.5	1052	7.0	2.60	1.4	30.4	13.8
19		0.072		6.94		1.38		1336		3.30		38.6	17.5
20	0.0029	0.049	0.299	5.06	0.0058	0.10	56.2	952	7.0	2.03	0.8	13.6	6.15
21		0.036		3.74		0.07		703		1.50		10.0	4.54
22	0.0026	0.043	0.301	4.96	0.0054	0.09	33.8	557	6.9	1.98	0.8	13.2	5.98
23		0.051		5.90		0.11		663		2.35		15.7	7.12
24		0.050		5.75		0.10		646		2.29		15.3	6.93
25	0.0026	0.048	0.266	4.88	0.0043	0.08	44.9	824	7.0	2.20	0.4	7.34	3.33
26		0.049		5.06		0.08		854		2.28		7.61	3.45
27	0.0026	0.048	0.237	4.39	0.0042	0.08	49.3	912	7.0	2.22	0.8	14.8	6.72
28		0.045		4.09		0.07		851		2.07		13.8	6.26
29	0.0026	0.025	0.221	2.14	0.0032	0.03	41.4	401	6.8	1.16	0.8	7.7	3.51
30		0.017		1.48		0.02		276		0.80		5.3	2.42
31		0.019		1.62		0.02		303		0.88		5.8	2.65
Total	0.035	1.520	3.330	144.9	0.109	5.124	574.3	24744	90.20	68.46	13.40	610.5	276.9
Sample Events	13	31	13	31	13	31	13	31	13	31	13	31	31
Daily Average	0.003	0.049	0.256	4.68	0.008	0.165	44.2	798	6.94	2.21	1.03	19.7	8.93
Lab Detection Limit	0.003		0.004		0.001		0.004		0.01		0.800		

MIN	0.003	0.017	0.183	1.475	0.003	0.021	33.800	276.386	6.800	0.800	0.400	5.341	2.422
MAX	0.003	0.072	0.317	6.940	0.050	1.377	56.200	1335.617	7.000	3.300	1.600	38.554	17.485

Notes:

$(X \text{ mg/L}) * (1 \text{ kg}/10^6 \text{ mg}) * (2.205 \text{ lbs/kg}) * (3.785 \text{ L/gal}) * (10^6 \text{ gal/Mgal}) * (Y \text{ Mgal/day}) = (X) * (Y) * (8.345) \text{ in lbs/day}$

$(X \text{ lbs/day}) * (1 \text{ kg}/2.205 \text{ lbs}) = (X) / (2.205) \text{ in kg/day}$

verified by Brian Johnson, 01/11/18

**KELLOGG TUNNEL DISCHARGE  
CENTRAL TREATMENT PLANT  
MONTH: Dec-17  
Data from SVL**

DAY	LEAD (Pb)		ZINC (Zn)		CADMIUM (Cd)		MANGANESE (Mn)		pH	006 FLOW		TSS	
	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day		mgd	mg/L	lbs/day	kg/day
1		11.39		1,137		1.48		2,143		2.57		1,694	768
2		11.26		1,123		1.46		2,118		2.54		1,675	759
3		11.17		1,115		1.45		2,102		2.52		1,662	754
4	0.531	10.97	53.0	1,095	0.0690	1.43	99.9	2,064	3.3	2.48	79.0	1,632	740
5		10.85		1,083		1.41		2,042		2.45		1,615	732
6		11.31		1,129		1.47		2,128		2.55		1,683	763
7	0.513	11.13	50.1	1,087	0.0658	1.43	99.5	2,159	3.5	2.60	64.0	1,389	630
8		10.95		1,070		1.40		2,125		2.56		1,367	620
9		11.17		1,091		1.43		2,167		2.61		1,394	632
10		11.00		1,074		1.41		2,133		2.57		1,372	622
11	0.543	11.52	54.1	1,148	0.0686	1.46	102	2,165	3.3	2.54	85.0	1,804	818
12		11.70		1,165		1.48		2,197		2.58		1,831	830
13		11.61		1,157		1.47		2,181		2.56		1,817	824
14	0.657	11.35	57.5	993	0.0706	1.22	113	1,952	3.4	2.07	85.0	1,468	666
15		4.82		422		0.52		830		0.88		624	283
16		12.06		1,056		1.30		2,075		2.20		1,561	708
17		13.92		1,218		1.50		2,393		2.54		1,800	816
18	0.578	12.54	54.8	1,189	0.0697	1.51	109	2,365	3.3	2.60	80.0	1,736	787
19		15.92		1,509		1.92		3,002		3.30		2,203	999
20		9.79		928		1.18		1,846		2.03		1,355	615
21	0.507	6.34	73.1	914	0.149	1.86	28.6	358	2.9	1.50	28.0	350	159
22		8.36		1,205		2.46		471		1.98		461	209
23		9.94		1,434		2.92		561		2.35		549	249
24		9.68		1,396		2.85		546		2.29		535	243
25	0.508	9.31	76.7	1,342	0.148	2.74	28.9	525	2.8	2.20	30.0	551	250
26		9.66		1,459		2.81		550		2.28		570	259
27		9.40		1,420		2.74		535		2.22		555	252
28	0.603	10.41	59.5	1,027	0.0782	1.35	104	1,795	3.2	2.07	69.0	1,191	540
29		5.84		576		0.76		1,007		1.16		668	303
30		4.03		397		0.52		694		0.80		461	209
31		4.41		435		0.57		760		0.88		504	229
Total	4.44	313.81	478.80	33393.98	0.72	49.49	684.90	49986.53	25.70	68.46	520.00	38077.02	17268.49
Sample Events	8	31	8	31	8	31	8	31	8	31	8	31	31
Daily Average	0.555	10.1	59.9	1,077	0.090	1.60	85.6	1,612	3.21	2.21	65	1228	557

Notes:

$(X \text{ mg/L}) * (1 \text{ kg}/10^6 \text{ mg}) * (2.205 \text{ lbs/kg}) * (3.785 \text{ L/gal}) * (10^6 \text{ gal/Mgal}) * (Y \text{ Mgal/day}) = (X) * (Y) * (8.345) \text{ lbs/day}$

$(X \text{ lbs/day}) * (1 \text{ kg}/2.205 \text{ lbs}) = (X) / (2.205) \text{ kg/day}$

verified by Brian Johnson, 01/11/18

**PTM Effluent at Lined Storage Pond  
CENTRAL TREATMENT PLANT**

**Month: Dec-17**

<b>DATE</b>	<b>LEAD mg/L</b>	<b>ZINC mg/L</b>	<b>CADMIUM mg/L</b>	<b>pH s.u. CTP Lab</b>	<b>TSS mg/L</b>
12/07/17	0.0134	9.9	1.01	7.40	0.4
12/21/17	0.0123	8.44	0.866	7.30	0.8

**RINSATE AND TRIP BLANKS  
CENTRAL TREATMENT PLANT**

**Month: Dec-17**

**Rinsate and Trip Blank samples will be taken approximately every 20  
QC events, or one each per month.**

<b>LOCATION</b>	<b>DATE</b>	<b>SAMPLE</b>	<b>LEAD mg/L</b>	<b>ZINC mg/L</b>	<b>CADMIUM mg/L</b>
<b>Rinsate &amp; Trip Blank</b>					
Kellogg tunnel Discharge		RB-12-11-17	<0.008	<0.010	<0.002
Trip Blank (D.I.water)		TB-12-11-17	<0.008	<0.010	<0.002

*verified by Brian Johnson, 01/11/18*

# Bunker Hill Central Treatment Plant

## Daily log December 2017

				AERATION BASIN				CLARIFIER				DISCHARGE 006						RECYCLE SG		LIME SLURRY			SLUDGE PUMP		POND PUMP		SLUDGE GUN TEST		LINED POND						
		INFLUENT KT		a.m.		p.m.		a.m.		p.m.				a.m.		p.m.		DO	1/wk					Injection Valve		#3 600gpm									
DATE	Operators	GPM	pH	SET	pH1	grab	pH1	grab	pH2	grab	pH2	grab	TURB	TEMP	pH3	grab	pH3	grab	PPM	TEMP	TURB	FLOW	SG	GPM	SG	%solid	Closed/Open	pump #	min	ON	OFF	10' Out	20' Out	Elevation (mg)	
12/1	GF,GC			8.3	8.3	8.3	8.3	8.3	7.5	7.5	7.5	7.8	1.60	53	7.3	7.5	7.3	7.4			1.39	2.57	1.045	400	1.056	8.8	160/35	3	90					2271.0 (2.25mg)	
12/2	GC			8.3	8.4	8.4	8.4	8.4	7.5	8.0	7.5	7.9	1.29	50	7.3	7.3	7.4	7.3			1.38	2.54	1.051	400	1.061	9.5	203/35	3	120					2271.0	
12/3	SB			8.3	8.3	8.4	8.3	8.3	7.5	8.0	7.5	7.9	1.22	49	7.3	7.2	7.3	7.3			1.13	2.52	1.044	400	1.063	9.8	198/35	3	120					2271.0	
12/4	GF,SB	1740	3.29	8.3	8.4	8.4	8.3	8.3	7.6	8.0	7.7	8.0	1.20	48	7.3	7.1	7.3	7.3			1.48	2.48	1.048	400	1.065	10.1	200/35	3	130					2271.0	
12/5	GF,SB,GC			8.3	8.4	8.4	8.4	8.4	7.5	8.0	8.1	8.0	1.78	49	7.3	7.2	7.3	7.3			1.49	2.45	1.045	400	1.067	10.4	210/35	3	120	#3 05:30	13:30			2270.9	
12/6	GF,SB,GC			8.3	8.4	8.4	8.6	8.6	8.0	8.0	8.1	7.8	1.75	47	7.3	7.2	7.4	7.2	10.0	6.2c	1.50	2.55	1.048	400	1.068	10.5	219/35	3	120	#3 04:30	13:30			2270.8	
12/7	GF,GC	1715	3.32	8.3	8.4	8.4	8.4	8.5	8.0	8.0	8.0	7.9	1.55	46	7.3	7.1	7.4	7.3			1.65	2.60	1.045	400	1.069	10.7	207/35	3	155	#3 05:30	13:30	12"	12"	2270.7 (2.0mg)	
12/8	GF,GC			8.3	8.3	8.3	8.3	8.3	8.0	7.9	8.0	7.8	1.13	45	7.2	7.0	7.4	7.1			1.13	2.56	1.040	400	1.066	10.2	213/35	3	90	#3 05:30	13:30			2270.5 (1.75)	
12/9	GC			8.3	8.3	8.4	8.4	8.4	8.0	7.9	8.0	7.8	1.25	43	7.4	7.4	7.4	7.3			1.06	2.61	1.045	400	1.065	10.1	208/35	3	90	#3-07:00	13:50			2270.25	
12/10	SB			8.3	8.3	8.4	8.4	8.4	7.9	8.0	8.0	8.0	1.27	41	7.3	7.2	7.4	7.3			1.17	2.57	1.045	400	1.066	10.2	211/35	3	120	#3-06:30	13:30			2270.0 (1.5mg)	
12/11	GF,SB	1701	3.33	8.3	8.3	8.3	8.4	8.4	8.0	8.0	7.9	8.0	1.45	40	7.3	7.1	7.4	7.3			1.28	2.54	1.051	400	1.067	10.4	204/35	3	120	#3-04:45	13:45			2269.4 (1.2mg )	
12/12	SB,GC, GF-4			8.3	8.3	8.3	8.3	8.3	8.0	7.9	7.9	7.9	1.47	41	7.3	7.2	7.3	7.2			1.32	2.58	1.043	400	1.067	10.4	205/35	3	90	#3-05:25	13:00			2268.9 (.95mg)	
12/13	GF,SB,GC			8.3	8.3	8.4	8.3	8.3	7.9	7.9	8.0	8.0	1.38	39	7.3	7.4	7.3	7.3	9.70	5.8c	1.33	2.56	1.047	400	1.067	10.4	205/35	3	115					2268.5 (0.75)	
12/14	GF,SB,GC	1652	3.32	8.3	8.3	8.3	NA	NA	7.9	7.9	NA	NA	1.55	49	7.4	7.2	NA	NA			1.42	2.07	1.043	400	1.067	10.4	188/35	3	203					2268.5	
12/15	GF, GC			8.3	8.4	8.4	8.2	8.2	7.6	7.8	7.6	7.6	1.44	40	7.1	7.2	NA	NA			1.50	0.88	1.020	400	1.066	10.2	PM 179/35	3	114					2272.8 (3.6mg)	
12/16	GC			8.3	8.3	8.3	8.4	8.4	7.9	7.9	7.9	7.8	1.71	45	7.3	7.4	7.3	7.3			1.41	2.20	1.040	400	1.071	11.0	161/35	3	90	#3-06:30	14:15			2274.3 (4.7mg)	
12/17	SB			8.3	8.4	8.4	8.5	8.5	7.9	8.0	7.9	8.0	1.18	43	7.3	7.2	7.3	7.2			1.14	2.54	1.045	400	1.070	10.8	214/35	3	95	#3-06:15	13:45			2274.0 (4.5mg)	
12/18	GF,SB	1650	3.32	8.3	8.4	8.4	8.5	8.6	7.9	8.0	7.9	7.8	1.15	43	7.3	7.2	7.3	7.3			1.15	2.60	1.051	400	1.072	11.1	219/35	3	120	#3, #1-06:15	#3 cont.			2273.7 (4.3mg)	
12/19	GF,SB,GC			8.4	8.4	8.4	8.5	8.4	7.9	8.0	7.9	7.8	1.46	42	7.2	7.5	7.3	7.3			1.20	3.30	1.051	400	1.070	10.8	182/35	3	120	#3, #1-05:30	13:30			2272.8 (3.5mg)	
12/20	GF,SB,GC			8.5	8.5	8.4	8.6	8.6	7.9	7.9	7.9	7.9	1.44	45	7.2	7.3	7.3	7.3	10.1	6.2c	1.38	2.03	1.035	400	1.069	10.7	200/35	3	60	#3, #1-05:30	10:00			2271.0 (2.25mg)	
12/21	GF,SB,GC	666	2.52	8.5	8.5	8.5	8.3	8.2	7.9	7.9	7.9	7.9	1.03	41	7.2	7.3	7.2	7.3			1.06	1.50	1.022	400	1.066	10.2	294/20	3	60					2269.5 (1.25mg)	
12/22	GC,GF			8.3	8.3	8.3	8.3	8.3	7.9	7.9	7.9	8.0	0.80	41	7.2	7.0	7.3	7.2			0.94	1.98	1.048	400	1.067	10.4	183/35	3	110					2269.5	
12/23	GC			8.3	8.4	8.4	8.4	8.4	7.9	7.9	7.8	7.8	1.35	38	7.3	7.2	7.3	7.2			0.89	2.35	1.046	400	1.070	10.8	196/35	3	90					2269.5	
12/24	SB			8.3	8.3	8.4	8.2	8.3	7.8	7.9	7.8	7.9	1.46	39	7.3	7.2	7.3	7.2			1.27	2.29	1.048	400	1.069	10.7	201/35	3	100					2269.5	
12/25	GF,GC	1650	3.32	8.3	8.3	8.3	8.3	8.3	7.8	7.9	7.9	7.9	1.60	39	7.2	7.2	7.2	7.1			1.45	2.20	1.047	400	1.066	10.2	195/35	3	100					2269.5	
12/26	GC,SB			8.3	8.3	8.4	8.3	8.3	7.8	8.0	7.9	8.0	1.43	38	7.3	7.2	7.3	7.2			1.32	2.28	1.048	400	1.068	10.5	184/35	3	100					2269.5	
12/27	GC,SB			8.3	8.3	8.3	8.3	8.3	7.8	7.9	7.8	7.9	1.53	39	7.3	7.2	7.3	7.2	8.50	9.8	1.65	2.22	1.046	400	1.067	10.4	182/35	3	90					2269.5	
12/28	GC,SB	1314	2.95	8.3	8.4	8.4	8.6	8.6	7.8	7.9	7.7	7.8	1.41	47	7.3	7.2	7.3	7.2			1.44	2.07	1.045	400	1.069	10.7	208/35	3	95					2269.5	
10/29	GC			8.5	8.5	8.5	8.6	8.6	7.7	7.8	7.8	7.8	1.45	44	7.2	7.2	7.2	7.3			1.29	1.16	1.028	400	1.068	10.5	266/20	3	0					2270.0 (1.50mg)	
10/30	GC			8.5	8.5	8.5	8.5	8.5	8.0	7.9	8.0	7.9	1.20	47	7.1	7.2	7.1	7.2			0.96	0.80	1.038	400	1.069	10.7	260/20	3	0					2270.0	
10/31	SB			8.5	8.5	8.5	8.5	8.4	7.9	7.8	7.9	7.9	1.21	39	7.2	7.2	7.3	7.2			1.18	0.88	1.038	400	1.067	10.4	304/20	3	0					2270.0	
																			1/wk	1/wk															
Averages:				8.34	8.37	8.38	8.39	8.39	7.82	7.91	7.85	7.87	1.38	43.5	7.25	7.22	7.30	7.25	PPM	*c	1.29	2.21	1.04					98							
Notes:																													3027						
																												1,816,200	Gallons						
	12-01-17 07:30 Decreased lime dilution water to lime slurry holding tank to increase specific gravity of lime solution. Dilution water flow meter not working.																																		
	12-05-17 05:30 - 13:30 KT flow of 1750 gpm diverted to the lined storage pond, #3 L.P. pump activated to draw down the lined storage pond. PH increased to 8.40 from 8.30 during pond pumping																																		
	12-06-17 04:30 - 13:30 KT flow of 1750 gpm diverted to the lined storage pond, #3 L.P. pump activated to draw down the lined storage pond. PH increased to 8.40 from 8.30 during pond pumping																																		
	12-07-17 05:30 - 13:30 KT flow of 1750 gpm diverted to the lined storage pond, #3 L.P. pump activated to draw down the lined storage pond. PH increased to 8.40 from 8.30 during pond pumping																																		
	12-08-17 05:30 - 13:30 KT flow of 1720 gpm diverted to the lined storage pond, #3 L.P. pump activated to draw down the lined storage pond. PH increased to																																		



**CENTRAL TREATMENT PLANT****MISCELLANEOUS FLOWS**

Month : Dec-17

Date	KT Flow Meter Reading
11/30/2017	0
12/31/2017	67,280,860
Total	67,280,860

Date	006 Flow Meter Reading
11/30/2017	0
12/31/2017	67,280,860
Total	67,280,860

Sweeny Pump Station Reading				
Date	#1 Pump	620 gpm	#2 Pump	500 gpm
11/30/2017	170.0	Hours	785.0	Hours
12/31/2017	170.0	Hours	785.0	Hours
Total Hours	0.0	Hours	0.0	Hours
Total Flow for 004/Sweeny For The Month =			0	Gallons

Date	Lined Storage Pond Water Level			
11/30/2017	2,250,000	gal	Elev. =	2271.0
12/31/2017	1,500,000	gal	Elev. =	2270.0

**Lined Storage Pond Influent Flows****PTM Discharge Flow**

Date	Flow (gpm)
12/07/17	12.0
12/21/17	12.0

**Old Mine Line Discharge Flow**

Date	Flow (gpm)
NA	NA

**2017-May 03 to 2018-May 02 BHCTP LIME USAGE AFW/WOOD**

Month	Silo A						Silo B						Total	
	Initial Level	Final Level	Diff. (ft)	Diff. (tons)	Tons Added	Net Tons	Initial Level	Final Level	Diff. (ft)	Diff. (tons)	Tons Added	Net Tons	Net Tons	Tons/Day
May 3-May 31	16.00	16.00	0.0	0.0	0.00	0.0	14.00	7.30	6.7	36.1	183.79	219.9	219.9	7.58
June 1-June 30	16.00	11.40	4.6	24.8	83.42	108.2	7.30	13.2	-5.9	-31.8	67.10	35.3	143.5	4.78
July 1-July 31	11.40	11.00	0.4	2.2	0.00	2.2	13.20	8.50	4.7	25.3	114.10	139.4	141.6	4.57
August 1-August 31	11.00	15.80	-4.8	-25.9	40.50	14.6	8.50	16.3	-7.8	-42.0	115.00	73.0	87.6	2.83
Sept. 1 - Sept 30	15.80	11.30	4.5	24.3	76.50	100.8	16.30	16.30	0.0	0.0	0.00	0.0	100.8	3.36
Oct. 1 - Oct. 31	11.30	14.30	-3.0	-16.2	77.00	60.8	16.30	16.30	0.0	0.0	0.00	0.0	60.8	1.96
Nov. 1 - Nov. 30	14.30	11.60	2.7	14.6	76.40	91.0	16.30	16.30	0.0	0.0	0.00	0.0	91.0	3.37
Dec. 1 - Dec. 31	11.60	11.70	-0.1	-0.5	76.80	76.3	16.30	16.30	0.0	0.0	0.00	0.0	76.3	2.46
				<b>Silo A</b>	<b>430.62</b>					<b>Silo B</b>	<b>479.99</b>		845.1	

NOTES:

May 3, 2017 A= 16.0 B = 14.0 AFW Beginning Levels

01-25-17 Placed slaker/silo B into service, slaker/silo A in six month standby mode.

04-20-17 Placed 4.9 ton into silo A and 31.1 ton into silo B, fill in preparation for contract changeover.

05-23-17 Received the initial Pete Lien & Sons lime delivery of 39.20 tons - Silo B

05-30-17 Received Pete Lien & Sons lime delivery of 37.50 tons - Silo B

06-01-17 Received Pete Lien & Sons lime delivery of 39.0 tons - Silo B

06-04-17 Removed Lime System B (Slaker B) from service and placed Lime System A into service. Lime System B in fail mode (lime feed auger has failed).

06-04-17 12:30 Operator measured the void space in Silo B at 9.0'. The silo B level indicator display reading at this time was 10.7'.

06-06-17 28.1 Tons placed into Silo B, **11.3 Tons placed into Silo A - Silo B Cone/Stack issues prevented loading entire truck into Silo B (15.1 ft)**

06-07-17 11:00 Placed slaker/silo A into service, placed slaker/silo B into standby mode

06-13-17 Drained and cleaned slaker B. 06-14-17 Drained and cleaned slaker A.

06-28-17 08:00 Slaker A removed from service, slaker B placed into service. Operators replaced the #2 lime loop pressure valve rubber body and slaker A drive shaft packing.

07-10-17 06:30 Slaker B removed from service due to a lime feed issue. Slaker A placed into service. Operators will investigate when time allows.

08-09-17 36 Tons placed into Silo B, 2 Tons placed into Silo A

08-22-17 Slaker B (Silo B) removed from service, Slake A (Silo A) placed into service - Six Month Rotation- Lime loop #2 off, Lime loop #1 on -Six Month Rotation-

**Tdl Tons Purchased 910.61**

**Average 3.86**

**Lime Daily Use - 7 Days**

	Silo A						Silo B						Total	
	Initial Level	Final Level	Diff. (ft)	Diff. (tons)	Tons Added	Net Tons	Initial Level	Final Level	Diff. (ft)	Diff. (tons)	Tons Added	Net Tons	Net Tons	Tons/Day
12/25-01/01	13.30	11.70	1.6	8.6	0.00	8.6	16.30	16.30	0.0	0.0	0.00	0.0	8.6	1.23

**Lime Silo A Depth Readings**

Date	Prior	After	Tons Received	Tons/ft
6/6/2017	14.6	16.7	11.30	5.38
6/15/2017	9.5	14.6	36.02	7.06
6/22/2017	10.1	15.2	36.10	7.08
8/9/2017	11.0	11.2	2.00	Estimated 10.00
8/28/2017	10.1	16.0	38.50	6.53
9/14/2017	8.7	14.6	38.00	6.44
9/25/2017	8.0	13.5	38.50	7.00
10/2/2017	10.8	16.3	38.50	7.00
10/27/2017	9.5	15.5	38.50	6.42
11/8/2017	10.1	15.3	36.90	7.10
11/21/2017	9.5	15.6	39.50	6.48
12/4/2017	9.9	16.0	39.00	6.39
12/18/2017	9.9	16.0	39.00	6.39
12/20/2017	9.5	15.0	37.80	6.87

**1 Month Average: 6.55**

**Lime Silo B Depth Readings**

Date	Prior	After	Tons Received	Tons/ft
5/22/2017	7.7	11.4	39.2	10.59
5/30/2017	3.5	7.5	37.5	9.38
6/1/2017	6.5	13.3	39.0	5.74
6/5/2017	10.8	15.1	28.1	6.53
7/10/2017	6.6	11.2	39.6	8.61
7/12/2017	10.5	17.0	35.0	5.38
7/31/2017	4.8	8.5	39.5	10.68
8/7/2017	6.4	11.3	39.5	8.06
8/9/2017	10.6	17.2	37.0	Estimated 5.61
8/21/2017	10.9	16.5	38.5	6.88

**6.85**

**Flocculant Received**

10/19/2017 2200 lbs  
12/12/2017 4400 lbs

FCI May 3 - 14, June 15, 22			AFW May 22 - 30, June 1, 6		
<u>Month (billing period)</u>	<u>Rec</u>	<u>Rec</u>	<u>Rec</u>		<u>TDL</u>
May 3 - May 14	8-May	13-May	14-May		
	36.00	32.21	38.88		107.09
May 23 - May 31	22-May	30-May			
Pete Lien & Sons	39.20	37.50			76.70
June 1 - June 15	1-Jun	5-Jun			
Pete Lien & Sons	39.00	39.40			78.40
	11.3/A, 28.1/B				
June 15 - June ??	15-Jun	22-Jun			
Graymont	36.02	36.10			72.12
FCI Lime Loads	179.21				
July 1 - 31	10-Jul	12-Jul	31-Jul		
	39.60	35.00	39.50		114.10
Aug 1-31	7-Aug	9-Aug	21-Aug	28-Aug	
	39.50	39.00	38.50	38.50	155.50
Sept 1-30	14-Sep	25-Sep			
	38.00	38.50			76.50
Oct 1-31	2-Oct	27-Oct			
	38.50	38.50			77.00
Nov 1-30	8-Nov	20-Nov			
	36.90	39.50			76.40
Dec 1-31	4-Dec	20-Dec			
	39.00	37.80			76.80
Total					910.61

## LIME DEMAND TRACKING

Year	Month	Lime (tons)	KT flow (mg)	Lime Demand (g/L)	
2006	Jan.	70.2	56.0	0.30	
	Feb.	69.9	51.2	0.33	
	March	96.3	56.3	0.41	
	April	107.5	72.0	0.36	
	May	235.4	72.0	0.78	peak
	June	114.6	68.3	0.40	
	July	100.4	64.0	0.38	
	Aug.	118.2	64.1	0.44	
	Sept.	38.4	54.5	0.17	
	Oct.	69.5	57.6	0.29	
	Nov.	71.3	55.2	0.31	
	Dec.	78.2	60.5	0.31	
2007	Jan.	66.0	56.3	0.28	
	Feb.	51.8	50.5	0.25	
	March	81.7	65.4	0.30	
	April	127.9	66.6	0.46	
	May	154.0	63.2	0.58	peak
	June	94.1	57.9	0.39	
	July	107.0	58.3	0.44	
	Aug.	75.8	55.3	0.33	
	Sept.	77.2	50.5	0.37	
	Oct.	62.3	50.1	0.30	
	Nov.	56.9	50.8	0.27	
	Dec.	28.1	52.0	0.13	
2008	Jan.	60.7	53.4	0.27	
	Feb.	50.2	49.3	0.24	
	March	58.0	54.6	0.25	
	April	78.3	61.7	0.30	
	May	629.3	86.7	1.74	peak
	June	388.1	82.6	1.13	
	July	155.6	66.3	0.56	
	Aug.	129.5	65.2	0.48	
	Sept.	97.2	61.1	0.38	
	Oct.	76.4	58.7	0.31	
	Nov.	64.9	52.0	0.30	
	Dec.	73.0	55.7	0.31	
2009	Jan.	70.3	50.9	0.33	
	Feb.	60.3	48.2	0.30	
	March	62.1	61.7	0.24	
	April	88.0	63.1	0.33	
	May	180.9	70.2	0.62	peak
	June	146.3	64.6	0.54	
	July	104.4	61.6	0.41	
	Aug.	94.8	56.4	0.40	
	Sept.	89.2	57.0	0.38	
	Oct.	69.4	55.8	0.30	
	Nov.	70.9	55.0	0.31	
	Dec.	47.4	54.5	0.21	
2010	Jan.	66.7	55.5	0.29	
	Feb.	51.5	50.8	0.24	
	March	49.5	54.7	0.22	
	April	50.0	56.3	0.21	
	May	58.7	58.8	0.24	
	June	58.8	56.8	0.25	
	July	79.7	56.7	0.34	peak
	Aug.	54.7	56.2	0.23	
	Sept.	63.8	54.1	0.28	
	Oct.	54.6	55.4	0.24	
	Nov.	54.1	55.8	0.23	
	Dec.	64.5	54.6	0.28	
2011	Jan.	77.1	61.7	0.30	
	Feb.	69.8	54.6	0.31	
	March	94.7	61.4	0.37	
	April	119.6	65.6	0.44	
	May	433.0	84.4	1.23	peak
	June	328.4	80.0	0.98	
	July	159.9	79.3	0.48	
	Aug.	120.8	70.3	0.41	
	Sept.	92.4	60.4	0.37	
	Oct.	97.8	62.4	0.38	
	Nov.	66.8	58.4	0.27	
	Dec.	65.2	58.6	0.27	
2012	Jan.	74.9	58.4	0.31	
	Feb.	56.8	57.7	0.24	

## LIME DEMAND TRACKING

Year	Month	Lime (tons)	KT flow (mg)	Lime Demand (g/L)	
	March	85.6	67.2	0.31	
	April	194.8	81.2	0.57	
	May	261.6	86.8	0.72	peak
	June	179.9	83.4	0.52	
	July	140.8	74.3	0.45	
	Aug.	118.0	68.9	0.41	
	Sept.	95.6	62.2	0.37	
	Oct.	89.0	60.0	0.36	
	Nov.	73.3	57.2	0.31	
	Dec.	74.8	61.8	0.29	
	<hr/>				
	2013 Jan.	57.2	61.9	0.22	
	Feb.	64.5	59.4	0.26	
	March	71.7	66.2	0.26	
	April	96.9	69.6	0.33	
	May	126.2	71.5	0.42	peak
	June	94.1	64.6	0.35	
	July	91.2	62.8	0.35	
	Aug.	89.2	58.4	0.37	
	Sept.	65.2	58.0	0.27	
	Oct.	59.3	58.3	0.24	
	Nov.	50.9	56.2	0.22	
	Dec.	49.9	56.9	0.21	
	<hr/>				
	2014 Jan.	38.7	57.4	0.16	
	Feb.	35.8	54.6	0.16	
	March	73.1	65.3	0.27	
	April	101.1	65.6	0.37	
	May	208.3	80.6	0.62	peak
	June	127.4	65.6	0.47	
	July	87.5	63.4	0.33	
	Aug.	81.1	61.5	0.32	
	Sept.	63.7	56.3	0.27	
	Oct.	53.1	60.6	0.21	
	Nov.	62.8	55.0	0.27	
	Dec.	54.6	59.7	0.22	
	<hr/>				
	2015 Jan.	51.7	58.4	0.21	
	Feb.	61.0	59.7	0.24	
	March	83.1	64.4	0.31	
	April	94.8	63.0	0.36	peak
	May	73.3	62.0	0.28	
	June	69.7	65.3	0.26	
	July	83.6	55.6	0.36	
	Aug.	58.4	55.3	0.25	
	Sept.	55.3	53.9	0.25	
	Oct.	56.8	52.0	0.26	
	Nov.	46.3	49.8	0.22	
	Dec.	43.7	51.5	0.20	
	<hr/>				
	2016 Jan.	24.2	52.2	0.11	
	Feb.	33.4	53.6	0.15	
	March	66.0	64.0	0.25	
	April	86.1	63.3	0.33	
	May	96.9	58.1	0.40	peak
	June	69.9	53.1	0.32	
	July	68.2	56.5	0.29	
	Aug.	53.7	53.2	0.24	
	Sept.	53.6	49.8	0.26	
	Oct.	49.8	52.4	0.23	
	Nov.	48.7	53.8	0.22	
	Dec.	48.3	52.0	0.22	
	<hr/>				
	2017 Jan.	51.7	49.3	0.25	
	Feb.	46.9	53.7	0.21	
	March	140.0	59.0	0.57	
	April	174.5	61.9	0.68	
	May	246.6	84.2	0.70	peak
	June	143.5	73.1	0.47	
	July	141.6	69.4	0.49	
	Aug.	87.6	58.5	0.36	
	Sept.	100.8	67.4	0.36	
	Oct.	60.8	43.5	0.34	
	Nov.	91.0	72.4	0.30	
	Dec.	76.3	67.3	0.27	

# KELLOGG TUNNEL ZINC DATA

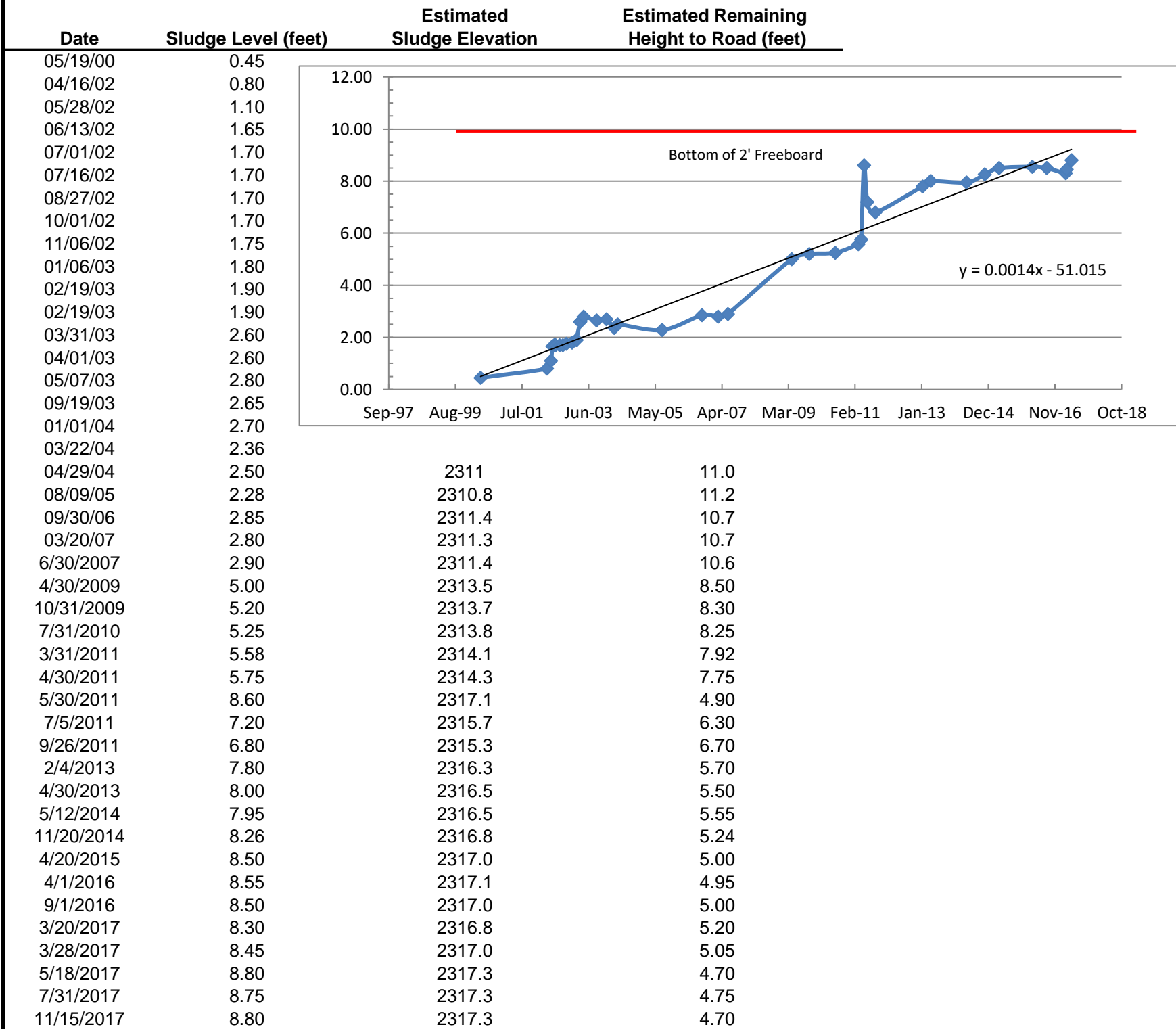
<u>Month</u>	Concentration (mg/L)													
	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>
Jan.		86	81	79	63	70	61	72	57	68	41	46	50	53
Feb.		86	91	96	55	72	57	95	58	68	41	68	52	50
March		94	116	86	65	68	53	86	58	69	58	81	63	124
April		98	121	140	85	80	50	137	176	86	107	92	115	238
May		105	231	179	318	136	57	377	215	150	177	87	138	206
June		107	182	118	271	143	68	347	164	106	131	78	108	145
July		90	144	111	198	117	75	181	136	87	87	75	81	97
Aug.		87	112	92	132	94	79	130	110	86	76	66	76	98
Sept.		84	107	80	107	76	81	132	107	75	66	63	68	75
Oct.	59	81	100	88	99	75	70	86	70	67	63	54	52	53
Nov.	66	79	88	88	104	63	57	95	71	70	55	44	52	58
Dec.	67	62	78	65	76	59	61	88	69	54	49	55	50	60
<b>average</b>	<b>64</b>	<b>88</b>	<b>121</b>	<b>102</b>	<b>131</b>	<b>88</b>	<b>64</b>	<b>152</b>	<b>108</b>	<b>82</b>	<b>79</b>	<b>67</b>	<b>75</b>	<b>105</b>
<b>lime usage</b> <b>(tons/day)</b>		<b>2.59</b>	<b>3.23</b>	<b>2.76</b>	<b>4.78</b>	<b>3.24</b>	<b>2.16</b>	<b>4.31</b>	<b>3.93</b>	<b>2.46</b>	<b>2.70</b>	<b>1.99</b>	<b>1.93</b>	
<b>Zinc Conc. Increase/Decrease</b>			<b>37%</b>	<b>-16%</b>	<b>29%</b>	<b>-33%</b>	<b>-27%</b>	<b>138%</b>	<b>-29%</b>	<b>-24%</b>	<b>-4%</b>	<b>-15%</b>	<b>12%</b>	
<b>Lime Usage Increase/Decrease</b>			<b>25%</b>	<b>-15%</b>	<b>73%</b>	<b>-32%</b>	<b>-33%</b>	<b>100%</b>	<b>-9%</b>	<b>-37%</b>	<b>10%</b>	<b>-26%</b>	<b>-3%</b>	

KELLOGG TUNNEL ANNUAL DISCHARGE FLOWS 2000-2009										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Jan.	61,000,000	61,677,510	54,606,100	53,066,890	52,223,080	53,150,000	56,050,900	56,281,000	53,465,820	50,936,960
Feb.	57,600,000	45,584,000	52,840,000	46,493,470	48,306,920	49,860,000	51,188,000	50,511,300	49,282,209	48,146,111
March	60,730,000	57,740,360	50,452,060	60,162,290	59,852,720	58,073,000	56,332,830	65,443,650	54,578,130	61,712,540
April	68,680,000	54,846,000	65,583,230	63,335,350	50,715,310	53,775,350	72,039,280	66,636,500	61,690,530	63,055,350
May	97,719,900	57,501,901	76,082,410	63,335,350	53,245,000	54,181,650	72,027,000	63,203,308	86,680,760	70,233,580
June	69,800,000	55,835,590	67,299,960	59,532,434	50,451,170	51,750,000	68,385,600	57,981,410	82,622,590	64,623,180
July	63,698,850	53,652,330	64,820,120	66,252,746	56,538,980	55,255,000	64,054,000	58,282,900	66,324,500	61,535,000
Aug.	66,707,120	45,289,000	58,212,940	62,074,750	52,002,140	49,970,000	64,621,000	55,335,900	65,168,620	56,446,670
Sept.	55,797,530	50,276,020	60,140,460	43,789,000	49,208,020	49,987,000	54,515,270	50,471,870	61,074,020	57,006,430
Oct.	60,424,720	50,660,840	54,485,871	52,869,290	59,601,690	52,807,000	57,610,030	50,086,330	58,666,300	55,830,000
Nov.	53,408,660	50,660,840	51,072,259	47,600,000	51,948,000	50,722,600	55,191,700	50,779,040	52,041,780	54,956,800
Dec.	56,414,870	53,464,780	56,034,000	56,413,080	56,770,000	54,904,400	60,486,900	53,716,210	55,727,260	54,542,700
Totals	771,981,650	637,189,171	711,629,410	674,924,650	640,863,030	634,436,000	732,502,510	678,729,418	747,322,519	699,025,321

KELLOGG TUNNEL ANNUAL DISCHARGE FLOWS 2010-2019										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Jan.	55,503,180	61,797,170	58,434,610	61,855,400	57,478,450	58,440,540	52,196,750	49,352,650		
Feb.	50,819,910	54,556,227	57,763,170	59,383,290	54,607,950	59,767,470	53,694,400	53,675,440		
March	54,691,420	61,373,630	67,236,650	66,264,780	65,396,350	64,468,230	63,967,920	58,977,410		
April	56,255,340	65,687,340	81,233,630	69,619,100	65,618,770	63,056,840	63,323,620	61,947,620		
May	58,825,640	84,365,390	86,826,340	71,496,380	80,598,590	61,898,200	58,147,240	84,208,690		
June	56,770,200	79,985,540	83,440,990	64,663,900	65,623,330	56,368,540	53,149,810	73,144,700		
July	56,727,510	79,346,330	74,315,690	62,844,790	63,425,030	55,655,000	56,521,710	69,470,550		
Aug.	56,239,370	70,377,570	68,986,900	58,459,380	61,486,270	55,316,100	53,293,430	58,550,600		
Sept.	54,109,980	60,404,280	62,270,300	58,097,500	56,279,590	53,890,000	49,796,420	67,447,510		
Oct.	55,480,200	62,403,480	59,991,850	58,325,780	60,659,850	52,082,800	52,417,120	43,469,300		
Nov.	54,856,880	58,430,700	57,184,220	56,215,000	55,065,100	49,812,540	53,815,710	72,434,860		
Dec.	54,607,330	58,617,700	61,750,390	56,932,530	59,770,540	51,521,900	52,063,110	67,280,860		
Totals	664,886,960	797,345,357	819,434,740	744,157,830	746,009,820	682,278,160	662,387,240	759,960,190	0	0

Yellow indicates record monthly flow as well as record annual flow

### Bunker Hill Sludge Pond Sludge Staff Gauge Reading Summary



**6389      8.35      Total Change, Days and Feet**

Note 3	0.48	Average Rise Per Year (Includes Lined Pond Cleanout), feet
	4.70	Estimated average remaining total height to perimeter road, feet
	2.0	Assumed desired end-of-life freeboard, feet
	2.7	Estimated available storage height, feet

**5.66      Estimated Remaining Life (years)**

7/12/2023

**Notes:**

1) Pond perimeter road centerline elevation = 2322.0 feet from CIA as-builts Drawing C-28



## CTP Mine Water Line Open Channel Inspection Form

**Note:** This form should be utilized weekly during the regular channel cleanout.

Results will be include with the Daily Quality Control Report and monthly DMR.

Date: December 07, 2017 Inspected By: Gary Coast, Gary Fulton

Item Inspected	Condition	Comments
Channel Sections and Joints	Good / Poor	Check for cracks Ok
Channel Inlet Connection @ KT	Good / Poor	Check for cracks Ok
Channel Outlet/Pipeline Inlet	Good / Poor	Check for cracks Ok
Channel Bottom (during low flows)	Good / Poor	Concrete walls show signs of pitting. Ok
Bottom Joints (during low flows)	Good / Poor	Ok
Trash Rack Assembly Rail Units	Good / Poor	Check for corrosion and bolt tightness Ok
Trash Racks	Good / Poor	Wood debris & grass clippings were removed
Parshall Flume	Good / Poor	Check fiberglass and joint connections Ok Flume staff gauge needs replaced

General Comments:

The Kellogg Tunnel flow at this time is 2.47 mgd (1715 gpm), pH at this time is 3.32

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

No debris was removed from the mine discharge flume during this cleaning event.

No discussions occurred with any mine personnel.

## CTP Mine Water Line Open Channel Inspection Form

**Note:** This form should be utilized weekly during the regular channel cleanout.

Results will be include with the Daily Quality Control Report and monthly DMR.

Date: December 14, 2017 Inspected By: Gary Coast, Steve Brunner

Item Inspected	Condition	Comments
Channel Sections and Joints	Good / Poor	Check for cracks Ok
Channel Inlet Connection @ KT	Good / Poor	Check for cracks Ok
Channel Outlet/Pipeline Inlet	Good / Poor	Check for cracks Ok
Channel Bottom (during low flows)	Good / Poor	Concrete walls show signs of pitting/corrosion
Bottom Joints (during low flows)	Good / Poor	Ok
Trash Rack Assembly Rail Units	Good / Poor	Check for corrosion and bolt tightness Ok
Trash Racks	Good / Poor	Wood debris was removed from both racks
Parshall Flume	Good / Poor	Check fiberglass and joint connections Ok Flume staff gauge needs replaced

### General Comments:

The Kellogg Tunnel flow at this time is 2.38 mgd (1652 gpm), pH at this time is 3.32.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

No debris was found in the flume trash racks during this cleaning event.

Operators had no conversations with any of the mine personnel during this cleaning event.

## CTP Mine Water Line Open Channel Inspection Form

**Note:** This form should be utilized weekly during the regular channel cleanout.

Results will be include with the Daily Quality Control Report and monthly DMR.

Date: December 21, 2017 Inspected By: Gary Coast, Steve Brunner

Item Inspected	Condition	Comments
Channel Sections and Joints	Good / Poor	Check for cracks Ok
Channel Inlet Connection @ KT	Good / Poor	Check for cracks Ok
Channel Outlet/Pipeline Inlet	Good / Poor	Check for cracks Ok
Channel Bottom (during low flows)	Good / Poor	Concrete walls show signs of pitting/corrosion
Bottom Joints (during low flows)	Good / Poor	Ok
Trash Rack Assembly Rail Units	Good / Poor	Check for corrosion and bolt tightness Ok
Trash Racks	Good / Poor	Wood debris was removed from both racks
Parshall Flume	Good / Poor	Check fiberglass and joint connections Ok Flume staff gauge needs replaced

### General Comments:

The Kellogg Tunnel flow at this time is 0.96 mgd (666 gpm), pH at this time is 2.52.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

Small amount of debris was removed from the mine discharge flume during this cleaning event.

No discussions occurred with any mine personnel.

## CTP Mine Water Line Open Channel Inspection Form

**Note:** This form should be utilized weekly during the regular channel cleanout.

Results will be include with the Daily Quality Control Report and monthly DMR.

Date: December 25, 2017 Inspected By: Gary Fulton

Item Inspected	Condition	Comments
Channel Sections and Joints	Good / Poor	Check for cracks Ok
Channel Inlet Connection @ KT	Good / Poor	Check for cracks Ok
Channel Outlet/Pipeline Inlet	Good / Poor	Check for cracks Ok
Channel Bottom (during low flows)	Good / Poor	Concrete walls show signs of pitting/corrosion
Bottom Joints (during low flows)	Good / Poor	Ok
Trash Rack Assembly Rail Units	Good / Poor	Check for corrosion and bolt tightness Ok
Trash Racks	Good / Poor	Wood debris was removed from both racks
Parshall Flume	Good / Poor	Check fiberglass and joint connections Ok Flume staff gauge needs replaced

### General Comments:

The Kellogg Tunnel flow at this time is 0.96 mgd (666 gpm), pH at this time is 2.52.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

Small amount of debris was removed from the mine discharge flume during this cleaning event.

No discussions occurred with any mine personnel.